

Abstract Submitted
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Machine learning control (MLC) — a novel method for optimal control of complex nonlinear systems¹ BERND R. NOACK, LAURENT CORDIER, VLADIMIR PAREZANOVIC, KAI VON KRBEK, PPRIME, Poitiers, France, MARC SEGOND, MARKUS W. ABEL, Ambrosys GmbH, Germany, STEVEN BRUNTON, University of Washington, USA, THOMAS DURIEZ, Universidad de Buenos Aires, Argentina — We propose a model-free closed-loop control strategy for complex nonlinear systems with a finite number of sensors and actuators (MIMO). This strategy yields a feedback law which optimizes a cost functional with machine learning methods. Thus, no dynamical model of the plant is required in contrast to model-based approaches, In addition, no working open-loop control is necessary in contrast to adaptive approaches. The approach is illustrated for strongly nonlinear dynamical systems which are not accessible to linear control design. Control studies of several shear-turbulence experiments will be presented in the talks of T. Duriez and V. Parezanović.

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